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JSC B/2 DATE APR 10 1950
MAJOR FRANK B. ROGERS, MC
Historical Division

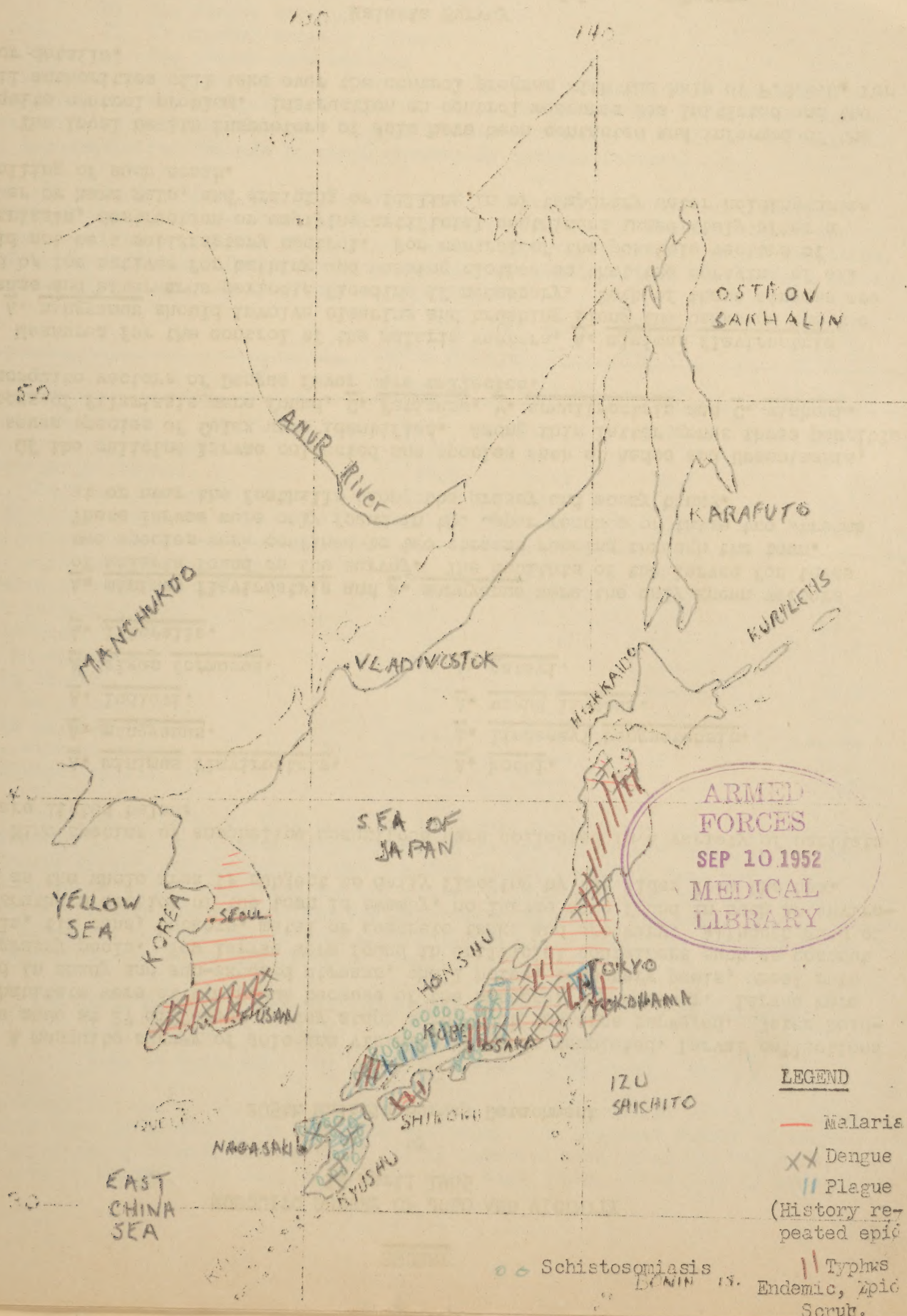
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Frank B. Rogers

Vol. II No. 6

Chief Malariologist, Hq USAFFE, APO 501

25 May 1945



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MOSQUITO SURVEY OF JOLO AND VICINITY

18 April 1945

by

205th Malaria Survey Detachment

A mosquito survey of Jolo and vicinity has been completed. Larval collections were made at 27 different survey stops throughout the area surveyed. Water holding habitats were at a minimum because of the seasonal dry weather. Larvae were found in shady and sun-exposed streams, shell holes, temporary pools, wheel ruts and grassy pools. Few larvae were found in artificial containers such as coconut shells, tin cans, buckets, metal or concrete tanks and crockery. Although much of the southern section of the town is swampy, no larvae were found in such an environment as the whole area is subject to daily flooding by the tides from the sea.

Nine species of anopheline mosquitoes were collected in a variety of habitats and are listed below:

<u>A. minimus flavirostris.</u>	<u>A. kochi.</u>
<u>A. mangyanus.</u>	<u>A. lindesayi benguetensis.</u>
<u>A. ludlowi.</u>	<u>A. vagus limosus.</u>
<u>A. gigas formosus.</u>	<u>A. gateri.</u>
<u>A. litoralis.</u>	

A. minimus flavirostris and A. mangyanus were the only known vectors of malaria found on the survey. The habitats of the larvae for these two species were confined to two streams running through the town. These larvae were only found in the upper reaches of these two streams at or near the foothills along the grassy and mossy banks.

Of the culicine larvae collected one species each of Aedes and Uranotaenia, and seven species of Culex were identified. Among this latter genus three possible vectors of filariasis were found, C. fatigans, C. annulirostris and C. vishnui. No mosquito vectors of Dengue fever were collected.

Measures for the control of the malaria vectors, A. minimus flavirostris and A. mangyanus should involve clearing and brushing along the banks of the two streams and afterwards periodic flooding if necessary. Both of these streams are used by the natives for bathing and washing clothes so that the spraying of oil would not be a satisfactory control. For control of the possible vectors of filariasis, destruction or emptying artificial containers immediately after a shower or hard rain, and draining or filling in of temporary water holding areas or oiling of such areas.

The local health inspectors of Jolo have been contacted and informed of the mosquito control problem. Instruction on control measures was initiated and the civil authorities will take over the control program with the help of P.C.A.U. for labor details.

Malaria Survey

	Jolo	Parang
Total examined	519	89
Percent showing malaria	66.5	85.4
Percent of total cases identified as <u>P. vivax</u>	91.5	94.7
Percent of total cases identified as <u>P. falciparum</u>	8.5	5.3

Approximately half of the individuals examined at Jolo came in for treatment of malaria symptoms, and many of these received treatment before any smears were taken. The results of the survey are to be checked by examination of the thin smears.

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Malaria Discipline

Clothing Survey Made in
Theatre Areas

The 41st Malaria Survey Unit under the command of Capt C. H. Daniels, Sn C, made a survey on Palawan during April of four theatre areas to ascertain to what extent the provisions of USAFEE Circular #34, dated 19 April 1944 were being complied with in-so-far as they pertain to clothing in malarious areas.

The various audiences were checked to determine the following:

- a. The number properly clothed
- b. The number wearing short sleeved shirts or having rolled sleeves
- c. The number of civilians in the area
- d. The number in undershirts
- e. The number wearing shorts
- f. The number wearing pajamas
- g. The number bare waisted

In order to secure an accurate count of as great a proportion of the audience as possible, one man tallied each factor. Unfavorable counting conditions encountered with approaching darkness and last minute crowding into the show area, made it impossible for one man to check accurately several factors.

In regard to par. 3j, (1) of the USAFEE Circular, nearly three quarters (70%) of the 1,482 men observed were improperly clothed. The wearing of short-sleeved shirts or rolling the sleeves constituted the greatest single violation, 41% being at fault. Civilians comprised a very small part of the overall theatre audience (9%). A summary of the survey follows:

	168 Evac Hospital	Ord Serv Center	1897 Engr Avn Bn	301 QM Rhd. Co.
Date	6 Apr 45	10 Apr 45	11 Apr 45	13 Apr 45
No. observed	400	111	547	424
No. properly clothed	235	49	112	55
% properly clothed	58.8	44.1	20.5	13.0
No. Civilians present	84	1	1	51
% civilians present	21.0	0.90	0.20	12.0
No. with forearms exposed	134	51	324	99
% with forearms exposed	33.5	45.9	59.2	23.3
No. in undershirts	25	8	59	43
% in undershirts	6.3	7.2	10.8	10.1
No in shorts	17	1	----	21
% in shorts	4.2	0.9	----	5.0
No. in pajamas	90	---	----	----
% in pajamas	22.5	---	----	----
No. without shirts	----	---	19	15
% without shirts	----	---	3.5	3.5

Upon completion, by this unit, of the movie survey, the data collected was presented to the Task Force Surgeon, and on 23 April a letter "Malaria Control in Movie Areas", was issued through command channels stating that movies will not be shown to personnel who are not fully clothed, and that the unit special service officers are responsible for enforcement in their respective theater areas. The directive further stated that noncompliance would result in the unit being dropped from the movie distribution schedule.

The April Malaria rates per/1000/annum at this base were as follows:

W.E. 7 April 45	86	W.E. 21 April 45	49
W.E. 14 April 45	97	W.E. 28 April 45	24

Investigation showed that the high rates were due to a general laxity in malaria discipline, particularly in regard to atabrine. The greatest number of cases occurred among infantrymen who were highly infected with parasites before arrival on Palawan. Primary cases have been negligible. From date of arrival

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through the 28 April, 68 cases of malaria were reported. Of these, 47 were from the infantry.

To reduce the high rates prevailing, the Task Force Surgeon on 17 April 1945 issued through command channels a comprehensive Malaria Control Directive. Among its provisions were the following:

a. "Unit commanders are responsible for the dissemination of the information contained in this letter to all personnel in their command."

b. "Circular No. 34, Hq USAFFE, dated 19 April 44, will be read carefully by all personnel of this command and this circular will be posted at all times in unit areas."

c. "Patients treated in quarters for any fever of undetermined origin will have a malaria smear taken within forty-eight hours. Arrangements for taking smears may be made with the nearest hospital."

d. "Hospital commanders and medical officers will carefully investigate all proven cases of malaria for infractions of malaria discipline and will report all such infractions to the Commanding Officer, Palawan Force, through the Surgeon, Palawan Force. Disciplinary measures will be taken against unit commanders where it has been proven that malaria has resulted as a result of infractions of this memorandum. CLINICAL MALARIA DOES NOT DEVELOP UNDER PROPER ATABRINE ADMINISTRATION."

e. "Unit commanders will immediately carry out the following: a. Acknowledge receipt of this letter. b. State that its provisions have been carried out within forty-eight hours of receipt."

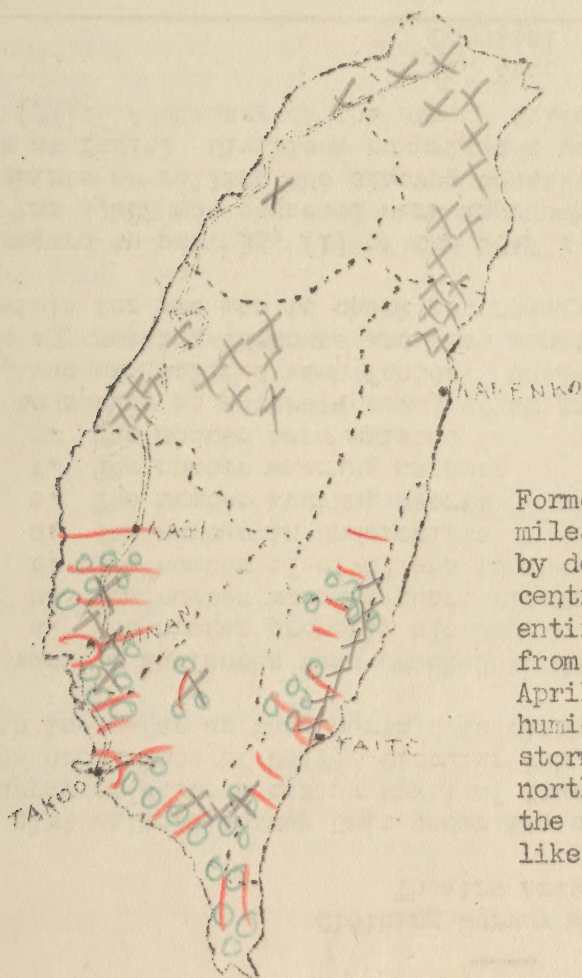
f. "The Surgeon, Palawan Force is responsible for contacting each individual unit as soon as is practical after the issue of this letter to aid units in the carrying out of the provisions of this letter; to furnish instruction of personnel where necessary; to aid in the procurement of any required equipment for individual units; and to subsequently investigate all units in this base to insure that the provisions of this letter are being carried out. A weekly report of progress of malaria control in this base will be submitted to this Hq."

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FORMOSA

Legend

- Malaria
- XX Dengue
- OO Schistosomiasis
- Typhus
 - Epidemic uncommon
 - Endemic "
 - Scrub, all coast & some in hills



Formosa is an island of about 14,000 sq miles, of which two-thirds is covered by dense tropical forest. The eastern central section of the island for the entire length is mountainous, running from 2000 to over 5000 feet. During April to October, the climate is hot and humid with torrential rains and thunderstorms. From October to March, north and northeast Formosa is cold and rainy while the southern half has winter climate much like that of Florida.

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FILARIASIS ON LEYTE.

by

Lt. Howard A. Bern, Sn C

The work reported by Lt. H. A. Bern of the 32nd Malaria Survey Unit was done to call attention to the possible consequences of the filariasis situation on Leyte.

Information received from a paper by Major James I. Knott, MC, who worked on the filariasis problem extensively in the Central Pacific area, indicates certain similarities between the situation in that area and that on Leyte as regards military personnel. Over 10,000 troops were lost to combat because of filariasis in the Pacific.

Data on filariasis obtained by 32nd Malaria Survey Detachment on Leyte, January-February 1945.

a. Nocturnal microfilaria incidences in adult civilians (thick smear technique).

BARRIO	DATE REPORTED	NO. EXAMINED	NO. POSITIVE	%POSITIVE
Julita	3 Jan 1945	148	22	14.9
Burauen	15 Feb 1945	222	25	11.3

b. Diurnal microfilaria incidences in adult civilians (thick smear technique).

BARRIO	DATE REPORTED	NO. EXAMINED	NO. POSITIVE
Cabatuan	15 Jan 1945	60 *	1
Tacloban	15 Feb 1945	8	1

* 4 other barrios revealed no microfilariae on daytime smears.
Diurnal incidence lower on Leyte than at Nadzab, New Guinea.

c. Diurnal microfilaria incidences in adult civilians (concentration using Major Knott's technique of hemolysis in 1% formalin).

BARRIO	DATE REPORTED	NO. EXAMINED	NO. POSITIVE
Julita	Not reported previously	63	2 *

* Not positive on thick smears.

d. Elephantiasis. Although this officer is not a clinician, the presence of considerable elephantiasis in Julita was readily noted during mid-night surveys, and conversation with the PCMU Dispensary civilians revealed several advanced cases (legs, arms, scrotum).

e. Mosquito vectors. Although the principal mosquito vector(s) of filariasis on Leyte has not been definitely decided to our knowledge, mosquito identifications by Captain Karl V. Krombein, Sn.C. entomologist of this unit reveal the following potential vectors as present in the Leyte Valley:

Species found on Leyte by 32nd M.S.D.	Remarks
<u>Aedes albopictus</u>	Complete development recorded (Belding)
<u>Anopheles barbirostris</u>	Complete development recorded (Belding)
<u>Anopheles hyrcanus</u> (certain subspecies)	Complete development recorded (Belding)
<u>Anopheles philippinensis</u>	Complete development recorded (Belding) (vector in India, Navy)
<u>Armigeres obturbans</u>	Incriminated as a vector of <u>Wuchereria</u> <u>malayi</u> (Belding)
<u>Culex fuscocephalus</u>	Complete development recorded experi- mentally in NEI (Navy)
<u>Culex bitaeniorhynchus</u>	" (?)
<u>Culex tritaeniorhynchus</u>	" (?)
<u>Culex vishnue</u>	Reported as vector in NEI (Navy)
<u>Mansonia species</u>	6 species of subgenus <u>Mansonioides</u> re- ported as vectors (Belding); a vector of <u>W. malayi</u> (Knott)

NOTE: Navy - Epidemiology of Diseases of Military Importance in the N.E.I.
Belding - Belding's Textbook of Clinical Parasitology.

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Discussion.

Attention is called to the fact that although a higher microfilaria incidence was found by this unit in New Guinea (30.0% nocturnal in adult ANGAU laborers at Nadzab) than exists on Leyte, the circumstances governing the transmission of filariasis to troops are different.

In the Southwest Pacific mosquito control was highly effective due to the military menace of malaria. On Leyte mosquito control was efficient only in the areas adjacent to the air strips for which air force malaria control units were responsible. Practically no area mosquito control was practised by organizations themselves because of the absence of malaria. Consequently opportunities were ripe for the breeding of the mosquitoes listed in the paragraph above.

In the Southwest Pacific native populations lived in areas considerably removed from military installations. Native labor camps were confined to small areas wherein mosquito control was usually fairly effective. On Leyte, most troops are garrisoned in and adjacent to native barrios, and there is free mixing of the military and civilian populations, both day and night.

Since symptomatic filariasis results from continued infection by microfilaria-carrying mosquitoes, the danger of filariasis to military personnel applies primarily to those base troops who are and will continue to garrison Leyte.

Major Knott recommends the separation of civilian and military personnel into areas beyond the flight range of the infected mosquito. This, of course, cannot readily be applied to conditions such as they exist on Leyte; hence the problem will remain an acute one as long as the mosquito vectors are not controlled.

Conclusion. It is suggested that military personnel garrisoning Leyte Island may eventually show a picture of clinical filariasis similar to that shown by personnel garrisoned in the Central Pacific islands. Reasons for this possibility are (1) the high nocturnal incidence of microfilariae in the blood of Leyte civilians and the existence of a diurnal incidence, (2) the large number of potential mosquito vectors on Leyte, (3) the close contact of military and civilian populations, (4) the absence of mosquito control to any appreciable extent, and (5) the obvious presence of elephantiasis in civilians.

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Peace Time Malaria Problems

Area of Zamboanga, Mindanao, P.I.

Information obtained by 90th Malaria Control Unit

In order to supplement information obtained from mosquito surveys, it was thought desirable to inquire about the peace time Malaria problems, prior to the Japanese invasion. Paragraph 3, of the letter subject, Technical report of mosquito survey with recommendations for control, Hq 205th Malaria Survey Unit, dated 25 March 1945, states:

"Four Anopheline species of larvae were found and included, A. Vagus Limosus, A. Litoralis, A. Lindesayi Benguetensis, and A. subpictus Indefinitus. The latter species is a known vector of malaria in the Celebes, and is a possible vector in this area. This species was found in a bomb crater of clear water."

Several Filipino physicians practicing in this area, as well as intelligent layman, trained in their professions, were interviewed. There was general agreement in the opinions expressed. During peace time, practically all categories of the economically important population lived on the coastal plain. The foot hills were very sparsely populated, and malaria was not considered a problem. The few cases seen were treated with quinine, atabrine and plasmochin.

After the Japanese invasion many of the civilians and guerrilla forces evacuated the coastal plain area to the foot hills. The important vector breeds in the foot hills. One Guerrilla medical officer told of a number of malaria cases in his unit, two of whom have the cerebral form of the disease. He did not have any figures. Some of the civilians after residence in the foot hills have malaria, however, the extent and degree of infection among civilians is not known at present.

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Mosquito Control - Plus

During the past few months the work of malaria control and survey units has become very versatile. A good example of how one unit has adapted themselves to new tasks, besides doing the regular job of oiling, clearing, filling, drainage, ditching and other routine jobs, is shown by the following extract from a report submitted by the 92d Malaria Control Unit, under the command of Loy A. Callen, Capt. Sn. C.

1. This organization in conjunction with the 97th Mal Cont Unit continued the Sanitary Campaign in Tacloban by removing daily, garbage and debris by truck to the base dump. Supervision and instruction of civilian Sanitary Inspectors were carried out and liason work between military and civilian authorities for continuation of health measures was also accomplished.
2. A V.D. Clinic was constructed by members of this unit by order of the Base Preventive Medicine Officer at Leyte Provincial Hospital Annex. The ground was cleared, tents pitched, and the entire area was screened in. Separate latrines, showers, and an inspection office were constructed for inmates.
3. Ditch constructed, latrine built and area leveled at prophylactic station built in downtown Tacloban.
4. Five members of this unit successfully completed Rodent Control School during the month of April. In connection with this, the civilian sanitary inspectors are receiving instructions on Rodent Control to bring this matter to the attention of the civilian population.
5. Trash and garbage cans have been distributed throughout the entire city area for civilian use. Civilian latrines were constructed and numerous other unsanitary ones were condemned. Inspectors of this unit recommended closing the city market because of very unsanitary conditions. This matter was brought to the attention of the Municipal Mayor and action is now being taken to correct the situation.
6. One member of this unit is a member of a Schistosomiasis Demonstration team which visited 39 military installations throughout the month giving instructions in schistosomiasis and other parasites found in the Philippine Islands.
7. 1936 homes were visited by the civilian women working for this organization as Sanitary Inspectors and the families were instructed in all general sanitary measures.
8. The undersigned assisted the Base Medical Inspector during the month with periodic medical inspections of various military installations throughout the base. Military and civilian installations were instructed in proper methods of employing mosquito control, fly control, and various other sanitary measures.

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Mosquito Reconnaissance
Palupandan, Negros Occidental, P.I.
Reported by 403d Medical Composite Unit (MS)

Nine species of anopheline mosquitoes have been discovered in the coverage area. Anopheles minimus flavirostris (Ludlow), the most important vector of malaria in the Philippines, was found only at Murcia, a town approximately 12 kilometers east of Bacolod, in rolling foothill country. The two most common anophelines collected were Anopheles subpictus indefinatus (Ludlow) and Anopheles vagus limosus King. Neither of these are considered important vectors of malaria. Other species found were Anopheles annularis Van der Wulp, Anopheles litoralis King, Anopheles ludlowi Theobald, Anopheles hyrcanus lesteri Baisas and Hu, and Anopheles hyrcanus nigerrimus (Giles).

The efficient dengue fever vector, Aedes aegypti (L.), was found breeding in numbers at 8 different collection sites in Bacolod, 3 sites in Talisay, and 2 sites in the southern portion of Silay despite the fact that only a small portion of the artificial catchments scattered throughout these cities were found to contain water. A total of 4% of the adult mosquitoes captured in the homes in Bacolod were identified as Aedes aegypti (L.).

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MANILA

Parasitology and Mosquito Surveys

The 213th and 39th Malaria Survey Detachments have both made surveys in the City of Manila. During the month of April, the 213th MSD did numerous surveys in the field of parasitology.

Malaria Parasite Surveys

a. Residents of Manila, living in refugee centers, who had not been outside of the city within three months of the time the smears were taken.

1. Total examined ----- 428
2. Percent of Positives -- 1.4

b. Residents of Manila who evacuated to the provinces, largely Laguna, between October, 1944 and February, 1945 and are now returning to their homes or to refugee centers.

1. Total examined ----- 231
2. Number positive ----- 73
3. Percent positive ----- 31.5
4. P. vivax rate ----- 10.3
5. P. falciparum ----- 9.5
6. Mixed infection of P. falciparum and P. vivax rate --- 11.6
7. Percent of positives in 1-5 year age group ----- 21.2
8. Percent of positives in 6-15 year age group ----- 24.5
9. Percent of positives in 16 and over group ----- 54.3

Intestinal Parasite Survey

These were done on children from one month to ten years of age who were living in refugee centers south of the Pasig River. (For obvious reasons, your Ed has deleted the names of the Refugee Centers, calling them "A" and "B".)

1. Refugee Center A.

1. Total cases examined ----- 94
2. Percent positive ----- 85.10
3. Total ascaris rate ----- 83
4. Unmixed ascaris rate ----- 45.7
5. Total trichocephalus rate ----- 37.2
6. Unmixed trichocephalus rate ----- 1
7. Hookworm rate ----- 3.1
8. Intestinal flagellate rate ----- 2.1
9. Rate of triple infections ----- 2.1
10. Rate of double infection ----- 36.1
11. Eosinophil count ----- 5.3

2. Refugee Center B.

1. Total cases examined ----- 81
2. Percent positive ----- 85.0
3. Total ascaris rate ----- 82.41
4. Unmixed ascaris rate ----- 45.51
5. Total trichocephalus rate ----- 37.90
6. Unmixed trichocephalus rate ----- 2.46
7. Hookworm rate ----- 7.38
8. Intestinal flagellate rate ----- 1.23
9. Quadruple infection rate ----- 1.23
10. Triple infection rate ----- 3.69
11. Double infection rate ----- 31.98
12. Average eosinophil count ----- 6.5

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The 39th MSD did much of their work in the East Greater Manila area, doing mosquito, blood and spleen surveys. The results of their work is reproduced below.

The area covered by this report is designated as East Greater Manila. It is bounded on the North by the Banlat Road, in the east by the Marikina River, on the south by the Pasig River, and the west by the San Juan River. Army installations, as well as three communities and several barrios, are also located here. Troops and civilians are living in close proximity to one another.

The area is generally flat with a maximum elevation of about 160 feet. In the northern portion the area is more undulating than in the southern portion. None of it is wooded. Much of it is populated by communities and under cultivation for rice. The area is drained by several streams and their tributaries. As three or four months of the dry season have gone by with little precipitation all the streams are low and their tributaries are intermittent or entirely dry. The precipitation for April was only 0.51 inches at Nichols Field which is a few miles distant. Most of the streams have bamboo and other vegetation growing along side them. They are generally clear with a limestone or gravel bottom. There is relatively little or no pollution in most of the streams. Permanent malaria control measures have been made in a few of the streams but because of lack of maintenance they are somewhat ineffective today.

Collections for anopheline larvae were made along the streams where minimus were apt to be found. Collections were not made in places such as rice paddies, carabao wallows, etc. where experience showed that minimus was very unlikely to be found. To date the following species of Anopheles have been collected:

<u>Anopheles minimus flavirostris</u>	<u>A. philippinensis</u>
<u>A. filipinae</u>	<u>A. hyrcanus lesteri</u>
<u>A. bancrofti</u> (pseudobarbirostris)	<u>A. hyrcanus nigerrimus</u>
<u>A. vagus limosus</u>	<u>A. ludlowi</u>
<u>A. annularis</u>	<u>A. subpictus indefinitus</u>
<u>A. barbirostris</u>	<u>A. kochi</u>

Larval densities for minimus were low in all streams. In spite of these low larval densities a sufficiently high adult population existed, apparently, to effect some transmissions especially in barrios where there was a high parasitemia rate. No effort was made to determine adult minimus densities.

While no particular effort was made to collect culicine larvae, the following species were identified from collections brought in:

<u>Culex summorosus</u>	<u>Culex (Lutzia) fuscus</u>
<u>Culex incognitus</u>	<u>Culex bitaeniorhynchus</u>
<u>Culex fuscocephalus</u>	<u>Culex fatigans</u>
<u>Culex adalae</u>	<u>Aedomyia venustipes</u>

House to house blood smear and spleen surveys were made on adults and children living in the communities and barrios within the area. The following results were obtained:

Community	Age 1-10 yrs.			Age 10 yrs & up			Spleen rate %		Epidemic Rate - %
	No. Exam	No. Pos.	%	No. Exam	No. Pos.	%	Age 1-10	Age 11- up	
Kamuning Park	86	3	3.5	68	1	1.5	0	0	0.3
Cubao	107	2	1.9	61	0	0	1.9	0	0.3
Capitol Site	59	13	22.0	87	14	16.0	21.0	2.4	2.67
San Francisco	91	1	1.0	37	0	0	0	0	1.6
Bodega-Bongad	53	7	13.2	64	1	1.6	10.0	0	1.0
Exposition Site	52	6	11.5	65	10	15.4	13.5	4.6	0.12
Balarat	32	9	28.0	42	17	40.0	34.0	10.0	5.0
Culiat	40	12	30.0	55	19	36.4	32.5	7.3	3.0
Baesa	54	1	1.9	47	1	2.1	0	0	0

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Community	Age 1-10 yrs.			Age 10 yrs & up			Spleen rate %		Epidemic Rate - %
	No.	No.	%	No.	No.	%	Age	Age	
	Exam	Pos.		Exam	Pos.		1-10	11-up	
Pasong Tamo	36	12	33.3	53	20	37.7	19.4	9.5	5.4
Talipapa	37	0	0	45	4	8.8	0	2.2	0.5
Mandaluyong	35	0	0	45	3	6.7	0	0	0.96
San Juan	38	2	5.3	56	6	10.7	8	0	0.88
T O T A L	720	68	9.4	725	96	13.2			

Of the 164 positive blood smears 70, or 42.7%, were Plasmodium vivax; 91, 55.5%, were P. falciparum; and 3, or 1.8%, were mixed vivax and falciparum infections.

Examination of the rates obtained from these surveys revealed some inconsistencies. In several instances (Mandaluyong, Talipapa, Balara, etc.) the blood rates in adults were higher than those in children. Ordinarily the reverse situation would be expected. The only explanation that could be made for these results is the fact that most of the adult men went to the hills during the Japanese occupation. While in the hills these men contracted malaria. Women and children remained in their homes because the Japanese were less wont to use them as slave labor. The men have returned to their homes now and show a higher parasitemia rate.

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MALARIA RATES - COMMENTS -- New Guinea

The Lae rate for the month of April is 3/1000/annum. The USASOS rate is 12/1000/annum. These rates are the lowest ever reported from this base. The low malaria rates for the month may be attributed to the excellent atabrine discipline at this base and also the effective mosquito control program. The dengue rate has shown a slight increase during the past two months. The rate being 35/1000/annum for April, however Aedes scutellaris breeding is very limited. It is very worthy of note that a marked increase in the malaria and dengue incidence has occurred in adjacent Australian troops.

The activities of the Base Malarialogist (Capt. C. G. Kadner, Sn C, Actg) consisted of a daily check of the hospitals for malaria admissions. Each patient was interviewed to determine the factors responsible for the occurrence of malaria. Each Commanding Officer concerned was informed of the findings and recommendations made to increase the effectiveness of unit control measures.

Routine inspections of unit areas were conducted. Unit Control for the month was very satisfactory. Little standing water was found on the base.

Rainfall for the month of April was 5.85 inches.

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Base F

With the exception of clothing discipline, there has been a startling improvement in Malaria Discipline and Control measures in the past two weeks. This is due, solely, to the recent Base Order on Malaria Control.

(1) Atabrine administration of organizations has improved greatly and continued close supervision of atabrine administration will pay future dividends in helping to lower the malaria rates.

(2) Organizations are oiling and eliminating mosquito breeding locations in and adjacent to their areas in a much more improved manner.

The local radio station makes spot announcements emphasizing certain features of malaria control and discipline.

The rates for the month of April are as follows per/1000/ per annum:

Week Ending 6 April, 29.3; W.E. 13 April, 53.3; W.E. 20 April, 30.7; W.E. 27 April, 26.5.

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Base H

The rate at this base had an increase at the end of the month compared with the first week, going from 17.0/1000/annum to 42.3/1000/annum for the last week of the month. This increase was caused by an increase of malaria mosquitoes in the depot areas and relatively poor malaria discipline.

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FIELD TEST OF DDT EMULSION

by

The 8th Malaria Control Unit
Capt. W. R. Hardy, Sn C.
Commanding

The Labengan river which originates in foothills near the Southern Coast of Mindoro Island meanders 10 miles through a flat alluvial plain to Mangarin Bay. The river is 100 - 150 yards wide but during the present dry season (about 1" rainfall in two months) the channel is only 6' to 20' wide and 6" to 24" deep. The water flows relatively swift through a gravel formation. In the shallow edges the water is from $\frac{1}{2}$ " to 2" deep and while having some movement is not flowing swiftly. This shallow water supports a stringy algae growth which extends from the gravel bottom to the surface. Anopheles maculatus maculatus, Anopheles ludlowii and Anopheles minimus flavirastris, were identified by the 31st Malaria Survey as the larvae found in this water containing algae. Anopheles larave density was about 10 per dip, the density of Anopheles minimus was relatively light.

Under these conditions it seemed doubtful if spraying with diesel oil would result in satisfactory control. Therefore it was decided to make a field test of the relative efficiency of diesel oil and DDT-oil-soap emulsion. A stock emulsion was prepared in the manner described by Captain Bryan of the 14th Malaria Control 31 January 1945 by mixing 7% DDT in diesel oil solution with a soap-water emulsion. This stock contained 24% soap and water emulsion and 76% DDT in oil solution.

A portion of the River about 450 yards in length having uniform characteristics and larvae density was divided into three sections. Beginning upstream the River was sprayed during the afternoon of 19 March 1945 by a Filipino laborer using a knapsack sprayer. A mixture of 3 oz DDT emulsion and 3 gallons of water was applied to the first section, a mixture of 4 oz DDT emulsion and 3 gallons of water to the second section and 3 gallons of diesel oil to the third.

The area was checked during the morning of 20 March 1945 with the following results:

- a. Anopheles larvae density in first and second sections was 0.08 per dip with 50% kill of culicine larvae.
- b. Anopheles larvae density in third section was 0.85 per dip. No appreciable decrease in culicine larvae was noted. There was no decrease in pupae density in any of the areas sprayed.

On the basis of this test the mixture of DDT emulsion and water is being used to control breeding in the Labangan River. Because of the obvious saving in labor and diesel oil this method is also being used to control breeding in smaller streams which support heavy vegetation along the banks. Results have been satisfactory to date. Further field tests of DDT emulsion will be made using other methods of application.

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Civilian Malarial Parasite Survey
Palupandan, Negros Occidental, P. I.

By 403d Medical Composite Unit (MS)

A group of 100 school children in Bacolod was examined to determine the incidence of malaria in civilians. Only 3 or 3% of the slides examined were positive. Of these cases, 2 were identified as P. vivax while 1 was a mixed infection of both P. vivax and P. falciparum. Investigation of the 3 positive cases showed that in each instance their families had just returned from the hills. Only 5% of the Bacolod school children were found to have enlarged spleens by Captain Monroe, Malarilogist, 40th Infantry Division.

Since 2 of the positive cases in the Bacolod survey were children who had lived in Murcia recently, a survey of 50 school children was made in this inland foothill town. Results showed a 6% malaria infection. The spleen rate as determined by Captain Monroe was 8%.

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SECRET

A Report of Four Schistosomiasis Cases From Luzon.

By Owen H. Graham, Capt., Sn C. and
Malcolm S. Ferguson, Capt., Sn C.

Through the courtesy of Lt. Col. W. V. Winkenwerder, Chief of the Medical Service, 118th General Hospital we were able to interview four schistosomiasis patients who had apparently contracted the disease on Luzon. All four of these soldiers were proven positive by laboratory diagnosis and none of them had ever been in China, Japan or the Philippine Islands before landing in the Lingayen area of Luzon.

The information of the movements of these men was obtained by questioning the men with the aid of a map and is believed to be accurate as far as geographical location is concerned, but the men were sometimes a bit unsure of the time involved. All of the towns shown on the overlay were visited by the soldier indicated, but they were not always sure of the route they had traversed in reaching some particular town.

The first man moved from Aitape to the Lingayen area without any intermediate stops. He debarked just north of San Fabian on 9 January. On the first day he moved to a location on the west bank of the Bued River only a short distance north of Binday. On the next day he crossed the Bued River moving east toward Pozorrabio. After a very short time he returned to the west side of the Bued, moved farther north, crossed the Bued again and moved east toward Mt. Alva. This position was captured on 17 January and he proceeded east to the North Road and then moved up to Camp One, passing through Sison on the way. On the 20 Jan he moved east from Camp One toward the mountains and it was there that he was hospitalized on 7 February. S. japonicum ova were found on 2 April at 118th General Hospital.

The second case moved from New Caledonia to Luzon, landing at San Fabian on 11 January. He was located in the vicinity of Manaog from 12 - 17th and remembers swimming in a stream there. He moved to Binalonan, spent a few days there, moved up to San Manuel, withdrew to Binalonan, and then to San Manuel again. From there he moved to Santa Maria where he became sick on 1 February and was hospitalized. He was proven positive for schistosomiasis by laboratory diagnosis at the 118th General Hospital on 8 April.

The third case moved directly to Luzon from Morotai. He landed somewhere between Lingayen and San Fabian on 10 February. He bivouaced in vicinity of Manoag for four days after debarking. About the 15th February he moved from there to the vicinity of Rosario, at a small barrio named "Dong Dong" by him. While here he bathed in a stream every third day. He first became sick on 27 February. Stool examinations at the 118th General Hospital revealed immature ova on 11 March and mature ova on 27 March.

The fourth case landed at the city of Lingayen on 9 January coming directly from New Britian. He moved down the highway through Samat, Umanday, and Aguilar, then west toward the Zambales Moutains. He spent the period 12 - 16 January west of Aguilar, then moved back to the highway and proceeded south to Camiling, where he spent two days. He remembers swimming in a stream just south of Camiling. He then moved south along the highway, passing through Tarlac and Bamban, and arriving at Guagua about the end of January. A few days later he moved back to Bamban and was bivouaced west of Bamban when he was hospitalized about 16 February. Immature ova were found on 5 April and mature ova on 6 April at the 118th General Hospital.

Inquiries have been made at all the other hospitals in the Base "K" area, but no other schistosomiasis patients have been found who were not located on Leyte during the exposure period.

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Attention Survey Units

Malaria Survey Units are still reporting anopheline breeding in cities, barrios and rural districts by means of only one symbol, i.e. a red mark of some kind being the most common symbol used.

Survey units are expected to report the genus of mosquito found in and near these areas and should attempt to differentiate by means of different type symbols the malaria and non-malaria vectors.

Maps showing only one type of symbol to represent places of anopheline breeding means nothing in the Philippine Islands where there is only one important vector, the others being either poor vectors or non-vectors.

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